Awareness of Eye Health and Disease in the population of hilly region of Nepal: A Community Based Study

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ABSTRACT

Background: Ocular diseases, such as, cataracts, glaucoma, and refractive errors, can lead to significant vision impairment or blindness if left unaddressed, affecting individuals' quality of life and limiting their daily activities. In rural communities with limited healthcare access, awareness about these conditions is often insufficient, resulting in delayed diagnosis and missed opportunities for early intervention. This study explores the level of eye health awareness in such a community, aiming to uncover knowledge gaps and common misconceptions. The findings are intended to guide targeted health interventions and educational efforts, empowering residents to seek timely eye care and reduce the impact of preventable visual impairment.

Methods: A cross-sectional survey was carried out from 6th Shrawan to 11th Shrawan 2079, involving 352 participants (199 males, 153 females). Data were collected using structured interviews focusing on awareness of eye diseases, causes, and preferred treatment options.

Results: The study revealed that 57.7% of participants responded blurring of vision as eye illness. However, only 14.8% recognized all common eye conditions. Cataract awareness was moderate, with 45.2% identifying age as the leading cause. However, 35.2% were unaware of any causes of cataract. Glaucoma awareness was low, with 69.6% being unfamiliar with the condition, and 75.6% unaware that vision loss due to glaucoma is irreversible. Awareness of strabismus was relatively high (69%), though misconceptions regarding its causes still persisted.

Conclusion: The findings indicate a significant gap in the community's awareness of eye health, particularly regarding cataract and glaucoma. This underscores the need for targeted educational programs to improve understanding and encourage early detection and treatment.

Keywords: Awareness; Cataract; Glaucoma; Knowledge; Night Blindness; Strabismus

INTRODUCTION

Community diagnosis, as defined by the World Health Organization (WHO), involves both quantitative and qualitative descriptions of the health status of a population, identifying factors that influence health, highlighting problems, and suggesting areas for improvement to stimulate action[1]. It serves as a foundation for improving and promoting the health of community members by assessing the factors that affect their health and evaluating the availability of resources within the community to address these concerns effectively[2].

The eye serves as a window to systemic health, with numerous systemic diseases manifesting through ocular signs and symptoms.[3] Conditions such as diabetes, hypertension, and autoimmune disorders often exhibit early indicators in the eye, highlighting the importance of ocular examinations in systemic disease management.[4] Advances in ocular imaging and diagnostics have further enhanced our ability to detect and monitor systemic conditions through the visual system.[5]

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systemic conditions through the visual system.[5] Understanding this interplay underscores the critical role of comprehensive eye care in promoting overall health.

In Nepal, community diagnosis is a vital tool for identifying health-related issues within a population and implementing strategies to address them. Ghachowk, located in Machhapuchhre Rural Municipality, presents a unique case for such an assessment. Machhapuchhre is situated in the Kaski district of Gandaki Province, Nepal, covering an area of 545 square kilometres and consisting of nine wards.

According to the 2011 Census, it has a population of 21,868, with most residents engaged in agriculture and animal husbandry. The community is diverse, with a mix of ethnic groups and religions, and Nepali being the predominant language spoken[6].

This study aims to assess awareness of common ocular conditions and available treatment options among the residents of Ghachowk to address potential knowledge gaps that may hinder early detection and effective management of eye diseases. Limited awareness in rural communities can lead to delayed diagnosis, progression of preventable eye conditions, and ultimately, an increase in avoidable vision impairment[7]. By evaluating the community's eye health-seeking behavior, the study seeks to identify the factors influencing whether individuals seek timely care, which is essential for improving ocular health outcomes and ensuring access to appropriate interventions.

Previous studies on eye health awareness often focus on urban or semi-urban populations[8], leaving a gap in understanding the specific challenges and barriers faced by rural communities like Ghachowk. These populations may have unique obstacles, including geographic isolation, limited access to eye care, and cultural beliefs that affect health-seeking behavior. There is also limited data on the community's baseline knowledge of different ocular conditions and treatment options, particularly for conditions with irreversible consequences like glaucoma. By filling this gap, the study can contribute to developing tailored, culturally relevant educational programs and interventions to improve eye health awareness and encourage proactive health-seeking behaviors in rural settings.

METHODS

The study was conducted in Ghachowk, Machhapuchhre Rural Municipality, Ward No. 3, located in the Kaski district of Nepal. The target population for this community diagnosis included all residents of this ward. A population-based cross-sectional study design was employed to assess the community's awareness of common ocular conditions and the available treatment options. A random sampling technique was utilized to select participants, and the sample size was calculated using Raosoft, resulting in a target of 347 households.

Data collection was conducted using a structured interview-based questionnaire with closed-ended questions. The questionnaire was validated based on a similar previous study conducted in Kathmandu titled "Awareness of Eye Health and Diseases among the Population of the Hilly Region of Nepal"[9] To ensure the validity and reliability of the data, the questionnaire was carefully designed to align with the study objectives. The data were analyzed using the Statistical Package for Social Sciences (SPSS). "Awareness" was characterized as having prior knowledge of the mentioned eye disease, while "knowledge" was defined as an understanding of the condition. The Chi-square test was employed to determine the association between knowledge of different eye diseases, including cataract, strabismus, glaucoma, night blindness, and the impact of systemic diseases on the eyes. Odds ratio with a 95% confidence interval were calculated for awareness of cataract and night blindness. Statistical significance was set at a P-value of ≤ 0.05.

Ethical approval for the study was obtained from the ward office of Machhapuchhre Rural Municipality, as well as from the Himalaya Eye Institute. All participants were informed about the study's purpose and objectives, and verbal consent was obtained before conducting the interviews. Confidentiality was assured, and participants were given the freedom to decide whether or not to answer the questions, ensuring their autonomy

throughout the study.

RESULTS

Demographic distribution of subjects who participated in the survey is presented in Table 1. Out of 352 individuals most of the individuals were from age 51-60 years. i.e. 22.2% followed by age group from 41-50 years (19.3%) and least individuals were from age group 18-30 years (19.6%). Most followed religion were found to be Hinduism (98.3%), followed by Buddhism (1.40%) and then by Christianity (0.30%). Regarding ethnic distribution most of the participants on the study were Brahmin and Chhetri (48.30%), followed by Dalit (33.50%) and least being Madhesi (3%).

Table 1: Demographic distribution of study population

Characteristics	N (%)
Age in years	
18-30	69 (19.6%)
31-40	70 (19.9%)
41-50	68 (19.3%)
51-60	78 (22.2%)
>60	67 (19%)
Sex	
Male	153 (43.47%)
Female	199 (56.53%)
Ethnicity	
Brahmin and Chhetri	170 (48.3%)
Janajati	63 (17.9%)
Dalit	118 (33.52%)
Madhesi	11 (3.13%)
Religion	
Hindu	324 (92%)
Buddhist	18 (5%)
Christian	11 (3%)
Education	
Illiterate	103 (29.3%)
Literate but no formal education	29 (8.2%)
Primary	75 (21.3%)
Secondary	74 (21%)
Higher secondary	52 (14.8%)
Bachelors and above	19 (5.4%)
Occupation	
Agriculture	242 (68.8%)
Services	16 (4.5%)
Business	41 (11.6%)
Labours	19 (5.4%)
Students	18 (5.1%)
Others	16 (4.5%)

Awareness about Eye-related Symptoms

Among all participants, majority considered vision blurring (203, 57.7%) as eye illness followed by burning/itching/foreign body sensation/grittiness (38,10.8%), pain/sore in the eye (21, 6%), Red eye, watering/discharge (11, 3.1%). Only 52 (14.8%) of the participants considered all of the mentioned options as eye illnesses. Most of the participants considered infection/germs (34.7%, 122) as the cause of eye illnesses, followed by environment pollution (94,26.7%), aging/nutrition (65,18.5%), Genetic/congenital (8.5%,30), waterborne disease (7, 2%) and evil/god/supernatural powers (6,1.7%).Likewise 16 (4.5%) didn't know about the causes of disease whereas 12 (3.4%) of total participant considered other causes for eye illnesses. According to the participants, in order to prevent they should visit health center (251%, 71.3%) followed by eye hygiene (9.4%, 33) eat green vegetables/fruits (28, 8%), eye protection/ glasses (20,5.7%), visit traditional healers (2,0.6%). None of the participants considered doing nothing as an preventive measure, whereas 4.5% didn't know about any measures whereas 0.6% considered other methods to prevent eye illnesses.

Table 2: Responses among those who were aware of eye illnesses

Response	No (%)
What are eye illness?	
Vision blurring	203 (57.7%)
Red eye	19 (5.4%)
Pain/sore in the eyes	21 (6.0%)
Burning/itching/foreign body sensation/grittiness	38 (10.8%)
Watering/discharge	11 (3.1%)
Others	60 (17.1%)

What are the causes of eye illness	
Infection/germs	122 (34.7%)
Environmental pollution	94 (26.7%)
Waterborne/pollution	7 (2.0%)
Genetic/congenital	30 (8.5%)
Evil/god/supernatural	6 (1.7%)
Aging/nutrition	65 (18.5%)
Others	12 (3.4%)
Don't know	16 (4.5)
What should you do to prevent eye illnesses	
Visit in health center	251 (71.3%)
Eye hygiene	33 (9.4%)
Visit in traditional healers	2 (0.6%)
Eat green vegetables/fruits	28 (8%)
Eye protection/glasses	20 (5.7%)
Don't know	16 (4.5%)
Others	2 (0.6%)

Awareness and Knowledge of Cataract

According to the study participant's response, they considered other options (38.1%, 134) as a cataract, whereas 30.1% (106) considered cataract as white spot in the eye followed by a white opacity in the lens (15.9%, 56), white opacity over the cornea (13.9%, 49) and a white spot seen through the pupil (12.5%, 44). According to the participants, cataract develops/occurs at old age (42.3%, 149) followed by may occur at any age (21.3%, 75), at birth (6.3%, 22) and during childhood (2.0%, 7) whereas 28.1% (99) individuals were unaware about the onset and development of the cataract. According to the participants the most leading cause of cataract was age (45.2%, 159) followed by malnutrition (7.7%, 27), trauma (4.8%, 17) and congenital cause (4.5%, 16). Among 352 participants 124 (35.2%) didn't know about cause of cataract and 9 (2.6%) participants considered other options such as eye infection and glaucoma as cause of cataract. Most of the participants knew about cataract through Doctors/FCHV/ paramedics/medicals (26.4%, 93) followed by friends/relatives/neighbours (20.7%, 73), Media-TV/radio/ newspaper (18.2%, 64), eye-camp/ pamphlets/brochures (16.8%, 59) whereas 17.9%, 63 participants knew about cataract through other means. Out of 352 participants 215 (61.6%) knew about the surgical option for the cataract whereas 49 participants (13.9%) considered medicine as a treatment option and 83 (23.6%) were unaware about the treatment modality for cataract and 5 individuals (1.4%) considered other options such as nutritional supplement for treatment of cataract. 302 (85.8%) of the participants considered to go to hospital/health facility for cataract treatment. 42 (11.9%) had no idea and 6 (1.7%) considered to visit faith healers/traditional healers and others 2 (0.6%).

Table 3: Responses among those who were aware of cataract

Response	**No (%)**
What is cataract?	
A white spot in the eye	106 (30.1%)
A white opacity in the lens	56 (15.9%)
A white opacity over the cornea	49 (13.9%)
A white opacity over the pupil.	44 (12.5%)
Others	90 (25.6%)
When does cataract develop/occur?	
Since birth	22 (6.3%)
During childhood	7 (2%)
Old age	149 (42.3%)
Any age	75 (21.3%)
Don't know	99 (28.1)
What is the cause of cataract?	
Age	159 (45.2%)
Trauma	17 (4.8%)
Congenital	16 (4.5%)
Malnutrition	27 (7.7%)
Don't know	124 (35.2%)
Others	9 (2.6%)
How did you know about cataract?	
Doctors/FCHV/para-medics/medicals	93 (26.4%)
Eye camp/pamphlets/ brochures	59 (16.8%)
Friends/relatives/ neighbours	73 (20.7%)
Media-TV/radio/news-paper	64 (18.2%)

Others	63 (17.9%)
What is the treatment for cataract?	
Medicine	49 (13.9%)
Surgery	215 (61.1%)
Don't know	83 (23.6%)
other	5 (1.4)
Where should you go for treatment?	
Hospital/health facility	302 (85.8%)
Faith healer/traditional healer	6 (1.7%)
No idea	42 (11.9%)
Others	2 (0.6%)

Responses among those who were aware of night blindness

Most of the participants 199 (56.5%) were unaware about the cause of night blindness. 104 (29.6%) had knowledge that vitamin A deficiency caused night blindness, followed by malnutrition 41 (11.6%) and other causes such as nerve problem, eye infection, cataract 8 (2.3%). 188 (53.4%) participants were unknown about the way of prevention of night blindness. 88 (25%) participants considered food-green leafy vegetables, yellow fruits as a preventive method followed by Vitamin A capsules 59 (16.8%), Food-meat and fish 6 (1.7%) and others such as refractive error, cataract, glaucoma 11 (3.1%).

Table 4: Responses among those who were aware of night blindness

Response	**No (%)**
What is Night Blindness?	
Difficulty to see in low light/night	198 (56.3%)
Don't Know	154 (43.7%)
What is the cause of night blindness in children?	
Vitamin A deficiency	104 (29.6%)
Malnutrition	41 (11.6%)
Don't know	199 (56.5%)
Others	8 (2.3%)
How can you prevent the night blindness? Frequency	
Food-green leafy vegetables, yellow fruits	88 (25%)
Food-meat and fish	6 (1.7%)
Vitamin A capsules	59 (16.8%)
Don't know	188 (53.4)
Others	11 (3.1%)
What are the sources of vitamin A?	
Food-green leafy vegetables, yellow fruits	88 (25%)
Food-mean and fish	6 (1.7%)
Vitamin A capsule	59 (16.8%)
Don't know	188 (53.4%)
Others	11(3.1%)

Responses among those who were aware of glaucoma

Out of 352, 245 (69.6%) participants were unaware about the glaucoma. 34 (9.7%) considered it as a high pressure in eye, followed by age related decrease in vision 24 (6.8%), 19 (5.4%) high pressure and 30 (8.5%) others such as eye infection, cataract etc. 266 (75.6%) were unaware whether vision loss due to glaucoma is reversible or permanent. 64 (18.2%) considered vision loss is permanent and 22 (6.3%) considered is reversible.

Table 5: Responses among those who were aware of glaucoma

Response	**No (%)**
What is Glaucoma?	
High pressure inside eye	34(9.7%)
Damage to the nerve of eye due to high pressure	19(5.4%)
Age related decrease in vision	24(6.8%)
Don't know	245(69.6%)
Others	30(8.5%)
Is vision loss in glaucoma reversible or permanent?	
Reversible	22(6.3%)
Permanent	64(18.2%)
Don't know	266(75.6%)

Responses among those who were aware of strabismus/crossed eye

Strabismus was considered as a deviation of eyes by 243 (69%) participants. 62 (17.6%) considered it as a looking sideway 39 (11.1%) as non-parallel alignment of eyes and 8 (2.3%) as a squeezing of eyes in bright light. 243 (69%) considered congenital/hereditary as a cause for strabismus. Other considered 62 (17.6%) Blessing/ curse/ luck, 35 (9.9%) diseases of eye, 8 (2.3%) traumatic eye, 2 (0.6%) gazing at intense light as a cause and 2 (0.6%) unaware. 91 (25.9%) participants considered strabismus would cause decreased with vision, 86 (24.4%) loss of confidence, 64 (18.2%) problem with the marriage, 42 (11.9%) psychological trauma and 69 (19.6%) others.

Table 6: Responses among those who were aware of strabismus/crossed eye

Response	No (%)
What is Strabismus?	
Deviation of eyes	243 (69.0%)
Squeezing of eyes in bright light	8 (2.3%)
Looking sideway	62 (17.6%)
Non parallel alignment of eyes	39 (11.1%)
What can cause strabismus?	
Congenital/ hereditary	243 (69%)
Traumatic eye	8 (2.3%)
Blessing/ curse/ luck	62 (17.6%)
Diseases of eye	35 (9.9%)
Gazing at intense light	2 (0.6%)
Don’t know	2 (0.6%)
Is there any remedy for strabismus?	
Yes	142 (40.35%)
No	183 (51.99%)
Don’t know	27 (7.66%)
What could be the problem with strabismus?	
Loss of confidence	86 (24.4%)
Psychological trauma	42 (11.9%0
Problem with marriage	64 (18.2%)
Decreased with vision	91 (25.9%)
Others	69 (19.6%)

Responses among those who were aware of systemic diseases

Among 352 participants, systemic illnesses were reported in 226 (64.2%). Hypertension (59.2%) and diabetes (25.6%) were the most common systemic illnesses, followed by arthritis (8%) and other conditions (7.2%). Of the total participants, 125 (35.5%) had no systemic illness, and 1 (0.3%) participant's illness status was unknown.

Among all, only 125 participants (35.5.9%) had undergone an eye checkup for systemic illnesses, Awareness about systemic illnesses was noted in 56.8.5% participant.

Table 7: Responses among those who were aware of systemic diseases

Response	No (%)
Do you have systemic illness?	
Yes	125
No	226
Don't know	1
What are they	What are they
Hypertension	74 (59.2)
Diabetes	32 (25.6%)
Arthritis	10 (8.%)
Asthma	9 (7.2%)
Did you undergo eye check-up for systemic illness?	
Yes	125 (35.5%)
No	226 (64.5%)
Don't know	1 (0.3%)
Could systemic illness affect eye?	
Yes	164 (46.59%)
No	72 (20.45%)
Don’t Know	116 (32.96%)
How did you come to know about effect of systemic illness in eye?	
Doctors/ FCHV/ paramedics/ medicals	91 (25.9%)
Eye camp/ pamphlets/ brochures	25 (7.1%)
Friends/ relatives/ neighbours	60 (17%)
Sufferings from systemic diseases	25 (7.1%)
Media-TV/ radio/ newspaper	49 (13.9%)

Others	102 (29%)

DISCUSSION

The present study, conducted as part of a community eye health project under the Himalaya Eye Hospital, aimed to assess the level of awareness and knowledge about common eye diseases in a population. The findings provide valuable insights into the current understanding of eye health, which can inform future eye health education programs.

Among the study population, awareness of cataract was higher than expected, where every participant were aware about the cataract but the knowledge was poor with only 4.8%. This aligns with findings from Attebo et al., who reported high awareness (98%) but low knowledge (20%) about cataracts.[10] Comparatively, a study in Takeo Province, Cambodia, found lower awareness of cataract treatment (18.6%)[11], while Dandona et al. reported a higher rate (82.8%).[12] These variations underscore the importance of not just raising awareness but also improving knowledge to ensure early detection and treatment.

Awareness of glaucoma was notably lower, with only 30.39% of participants being aware of the condition, which is still higher than previous studies that reported figures as low as 17.4%[8] and 2.4%[6]. Other studies, such as Livingston et al. and Attebo et al., reported much higher awareness levels in Australia (70% and 93%, respectively).[10,13] However, the knowledge of glaucoma in this study (15.05%) was lower than that in Australia but still higher than previous local studies.[8] These findings highlight the need for targeted campaigns to increase awareness and knowledge of glaucoma, particularly in under served populations.

Night blindness was moderately recognized, with 56.3% awareness and 41.4% having knowledge about the condition. Previous studies also found similar awareness levels (55.8%)[6], though knowledge of prevention methods was lower (33.4%).[10] A significant portion of participants (53.4%) did not know how to prevent night blindness, indicating a gap in public health education regarding vitamin A deficiency and its role in preventing childhood blindness.[14] Expanding vitamin A distribution programs and conducting more awareness campaigns could mitigate this issue.[15]

Strabismus awareness was notably high at 100%, which contrasts with lower awareness levels in studies by Shrestha GS et al. (70.8%)[9] and in Takeo Province (94%).[16] Knowledge of strabismus causes was also higher in this study (80.11%) compared to cataract knowledge. This aligns with findings from Geta and Bejiga, where 100% awareness was reported.[11] Strabismus, though relatively uncommon, can have significant psychological and social impacts[17], reinforcing the need for early intervention and public education. The study also found that 35.5% of participants had systemic diseases, with hypertension being the most common (59.2%), followed by diabetes (25.6%). Awareness of the impact of systemic diseases on eye health was higher in this study than in previous research by Shrestha GS et al..[9] Efforts to educate patients about the ocular complications of systemic diseases, such as hypertension and diabetes, are crucial to preventing vision loss.

In conclusion, while the population studied showed a high level of awareness regarding some eye conditions, there remains a significant gap in knowledge, particularly concerning prevention and treatment. This underscores the importance of continued education and outreach programs to improve understanding and encourage proactive eye care. However, knowledge regarding red eye conditions, such as conjunctivitis, uveitis and corneal ulcer is equally important. This aspect, however, was not extensively addressed in this study, which presents a limitation in understanding the broader spectrum of eye health awareness.

CONCLUSION

This study found lack of awareness and knowledge about eye health and common eye diseases among the residents of Machhapuchhre Rural Municipality, highlighting critical gaps in understanding conditions like cataracts and glaucoma. However, this finding is limited to the specific population studied and may not reflect the awareness levels across other rural or diverse regions. Therefore, while the results underscore the need for targeted educational interventions

in this community, further research involving broader and more varied populations is necessary to obtain a comprehensive understanding of eye health awareness in other settings.

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